Survey on Design of “Bus Boarding Assist System For Blind Using IOT Technology

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Abstract — This paper outlines the design of bus detection mechanism to help blind in travelling from one place to another. Navigation in outdoor environments is highly difficult for those who have congenital blindness or blindness from a very young age. Eye vision is the most important part of human physiology as 83% of information human being gets from the environment is via sight. For visually impaired people, outdoor pedestrian the ability to move is very difficult and often dangerous. WHO (World Health Organization) has a goal of reducing the blindness prevalence of India to 0.3% of the total population by 2020. Buses play a vital role for the transportation. Public transport is the only viable mobility option to seek social connectivity for a majority of blind and visually impaired persons. This project aims in implementing a bus boarding assist system for blind people with the help of Internet of Things, wireless communications and android technology. This design and implementation of bus detection and navigation mechanism is to help blind in travelling from one place to another using GPS, google API’s and IOT technology. Navigation in outdoor environments is highly difficult for those who have congenital blindness or blindness from a very young age. The Blind people on the Bus Station are provided with a Blind Unit. The blind speaks his destination on the microphone provided on the Android supported mobile device. When the desired bus stops at the station, camera captures bus number and these bus details are already stored in raspberry pi’s database. Users input destination is checked in the database and matched with the details of the bus arrived. Blind will be notified via speaker through the recorded voice. Now when bus reaches at any station, it will check at every station for blind person's destination and the person will be notified when the destination spot is arrived. Android app helps the blind person for navigating by giving directions as audio output.

Keywords- IOT, Raspberry Pi, camera, relays.

I. INTRODUCTION

In this world each and every person wishes to have a comfort life. A person who is unable to count fingers from a distance meters would be considered as blind. WHO has a goal of reducing the blindness prevalence of India to 0.3% of the total population by 2020. So accordingly the population of blind people in India will reduce from 1.20 crore (as per national Blindness survey 2007 data) to 80 lakh. Eye vision is the most important part of human physiology as 83% of information human being gets from the environment is via sight.

The Statistics by the World Health Organization (WHO) in 2011 estimates that there are 285 Billion People in the world with Visual Impairment, 39 Billion of people which are Blind and 246 with Low Vision. Especially India has highest number of Blind People amongst the world. For visually impaired people, outdoor pedestrian the ability to move is very difficult and often dangerous. Buses play an vital role for the transportation. Public transport is the only viable mobility option to seek social connectivity for a majority of blind and visually impaired persons. Thus to help the visually impaired people and to make them to gain confidence to move around freely is to make use of IOT Technology.

II. LITERATURE SURVEY

1. Existing System-In Earlier days most of blind people in bus stations would rely on others to ask help for the bus details such as bus number, Arrival time and destination etc. This would be very inconvenient and inefficient way and always he/she may not get the required help and the situation may not be always in peace. In existing system visually impaired commonly rely on a cane or walking stick and a guide dog to assist them in efficiently reaching a desired destination without harm. However, this approach is successful only if the
path to the destination is already known to the blind (or to the guide dog).

But this have some limitations. Guided dogs and walking canes allow for a more independent means of travelling, but they are limited in unfamiliar environments. Guided dog has price as new car and their Average working time is round about 7 years. This people get troubled themselves in travelling through a passenger bus or trains. Moving through an unknown environment becomes a real challenge when we can’t rely on our on eyes.

Those people live in a limited environment and have difficulty to sense what happen around them, which reduces their activities in several fields, such as education and transportation since they depend only on their own intuition. Hence, it is necessary to make their lives more comfortable by introducing a system that helps them enjoy transportation services independently and freely like ordinary people, without relying on others. The work we present in this paper is based on the use of New Technologies to improve Blind people mobility. There are other Technologies also available but these devices at the Blind end are too costly. So we have tried to make the device at the Blind end cost-effective.

III. PROPOSED SYSTEM

- Bus details are already stored in raspberry pi database.
- Blind person enters the bus stop and inputs the through mobile.
- Users input destination is checked in the database and matched with the details of the bus arrived.
- Blind will be notified via speaker through the recorded voice.
- Blind person will be notified when the destination spot is arrived.
- Android app helps the blind person for navigating by giving directions as audio output.

1. Raspberry Pi

![Fig.2 Raspberry Pi.](image)

It’s a credit card sized computer that plugs into a computer, monitor or T.V and uses a standard Keyboard and Mouse and can be programmed using Python and scratch. Its capable of doing everything that you expect a desktop system to do. It’s a main component used in our system to store and retrieve the Bus details and to interact with the user. The hardware is programmed mainly using Python programming language. The software revolves around the mobile. The android application that is used for navigation is developed using advanced Java programming language which uses GPS and Google API’s.

2. Relays

![Fig.3 Relays.](image)

A relay is an electrically operated switch. Almost all the relays use an electromagnet to operate a switch mechanically, but other operating principles are also used, such as solid-state relays. They are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal.

3. Speaker

![Fig.4 Speaker.](image)
Speaker is to produce audio output that can be heard by the listener. Speakers are transducers that convert electromagnetic waves into sound waves. The speakers receive audio input from a device such as a computer or an audio receiver.

4. Camera

A camera is an optical instrument to capture still images or to record moving images, which are stored in a physical medium such as in a digital system or on photographic film. A camera consists of a lens which focuses light from the scene, and a camera body which holds the image capture mechanism.

IV. CONCLUSION

This system has a user unit which is in the form of helmet that contains the pi camera that is mainly used to recognize the bus number and its route to specified destination by the user. After implementing all the modules of the system, the end device works as expected and is capable of handling. Initially, the blind informs the location he needs through the microphone that is given to the voice recognition system which produces the output of bus numbers in the voice synthesizer unit which is heard in headset. There are many efficient systems available for the blind people which are successful too. But the overall cost of the system is very high. In this system, the blind unit is minimized without affecting the goal of the overall system. This interactive system for the visually impaired people can be implemented in city buses, so that all the blind people can be benefitted in a big scale. Results of the tests indicated that this system could help users to successfully board their desired buses, using the interactive communication modules.

REFERENCES


